

CLAIMS:

1. A communication method comprising:
establishing (15) a wideband communication link between a first device
5 (11, 50, 60) and a second device (12, 51, 61), and
transmitting (16) a first set of consecutive data bits from said first device
to said second device by means of a first set of pulses, characterized by
transmitting (17) a second set of bits from said second device to said first
device at least partially simultaneously or at least partially interlaced with said
10 first set of bits.
2. The method of claim 1, wherein said pulses are narrow pulses.
3. The method of claim 1 or 2, wherein said pulses are spaced apart in time do-
15 main by a certain guard time and said second set of bits is transmitted by
means of a second set of pulses sent during said guard times.
4. The method of claim 3 further comprising:
negotiating pulse repetition frequency (PRF) for said communication link
20 link, at least when PRF for the communication link is not already known,
negotiating on the basis of the PRF of said communication link, whether
said guard times are used for sending said second set of bits.
5. The method of claim 1 or 2, wherein a separate radio is used for transmitting
25 said second set of bits.
6. The method of claim 5, wherein said separate radio is a Wireless Personal
Area Network (WPAN)-radio.
7. The method of claim 5 or 6, wherein said second set of bits is transmitted as
30 payload in a data channel of the separate radio.

8. The method of any one of the preceding claims, wherein said second set of bits comprises control data.
- 5 9. The method of any one of the preceding claims, wherein said wideband communication link is an ultra-wideband (UWB) communication link.
10. A system comprising
- 10 a first device (11, 50, 60) and a second device (12, 51, 61) configured to establish a wideband communication link between said first and second devices, said first device comprising a transmitter configured to send a first set of consecutive data bits to said second device and said second device comprising a receiver configured to receive said first set of consecutive data bits from said first device, said first set of bits being sent by means of a first set of
- 15 pulses, **characterized** in that
- said second device (12, 51, 61) further comprises a transmitter (42) configured to send a second set of bits to said first device at least partially simultaneously or at least partially interlaced with receiving said first set of bits from said first device, and in that
- 20 said first device (11, 50, 60) further comprises a receiver (46) configured to receive said second set of bits from said second device at least partially simultaneously or at least partially interlaced with sending said first set of bits to said second communication device.
- 25 11. A device (12, 51, 61) comprising
- a receiver (46) configured to receive a first set of consecutive data bits from another device, said first set of bits being sent by means a first set of pulses, **characterized in that** said device further comprises
- a transmitter (42) configured to send a second set of bits to said another
- 30 device at least partially simultaneously or at least partially interlaced with receiving said first set of bits from said another device.

12. The device of claim 11, wherein said pulses are narrow pulses.

13. The device of claim 11 or 12, wherein

5 said receiver is configured to receive said first set of pulses so that there is a certain guard time between the pulses, and

 said transmitter is configured to send a second set of pulses forming said second set of bits during said guard times.

10 14. The device of claim 13 further comprising:

 means for negotiating with said another device pulse repetition frequency (PRF) for said first set of pulses, at least when said PRF is not already known, and

 means for negotiating on the basis of said PRF, whether said guard times
15 are used for sending said second set of bits.

15. The device of claim 11 or 12, wherein said transmitter and said receiver employ different radio technologies.

20 16. The device of claim 153, wherein said transmitter is a Wireless Personal Area Network (WPAN) radio transmitter.

17. The device of any one of claims 11-16, wherein said receiver is an ultra-wideband (UWB) receiver.

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18. The device of any one of claims 11-17, wherein said second set of bits comprises control data.

19. The device of any one of claims 11-18, wherein said device is one of the following: a communication device, a mobile phone, a laptop computer, a desk-
30 top computer, a Personal Digital Assistant (PDA), and a digital camera.

20. A device (11, 50, 60) comprising
a transmitter (42) configured to send a first set of consecutive data bits to
another device by means of a first set of pulses, **characterized** in that said de-
vice further comprises
a receiver (46) configured to receive a second set of bits from said an-
other device at least partially simultaneously or at least partially interlaced
with sending said first set of bits to said another device.
21. The device of claim 20, wherein said pulses are narrow pulses.
22. The device of claim 20 or 21, wherein
said transmitter is configured to send said first set of pulses so that there
is a certain guard time between the pulses, and
said receiver is configured to receive a second set of pulses forming said
second set of bits during said guard times.
23. The device of claim 22 further comprising:
means for negotiating with said another device pulse repetition frequency
(PRF) for said first set of pulses, at least when said PRF is not already known,
and
means for negotiating on the basis of said PRF, whether said guard times
are used for receiving said second set of bits.
24. The device of claim 20 or 21, wherein said transmitter and said receiver em-
ploy different radio technologies.
- ~~25. The device of claim 24, wherein said receiver is a Wireless Personal Area
Network (WPAN) radio receiver.~~
- ~~26. The device of any one of claims 20-25, wherein said transmitter is an ultra-~~

wideband (UWB) transmitter.

27. The device of any one of claims 20-26, wherein said second set of bits comprises control data.

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28. The device of any one of claims 20-27, wherein said device is one of the following: a communication device, a mobile phone, a laptop computer, a desktop computer, a Personal Digital Assistant (PDA), and a digital camera.

10 29. A computer program executable in a communication device, the communication device being configured to receive a first set of consecutive data bits from another device, said first set of bits being sent by means of pulses, said computer program controlling said communication device to

15 send a second set of bits to said another device at least partially simultaneously or at least partially interlaced with receiving said first set of bits from said another device.

30. The computer program of claim 29 stored on a carrier.

20 31. A computer program executable in a communication device, the communication device being configured to send a first set of consecutive data bits to another device by means of pulses, said computer program controlling said communication device to

25 receive a second set of bits from said another device at least partially simultaneously or at least partially interlaced with sending said first set of bits to said another device.

32. The computer program of claim 31 stored on a carrier.

30 33. A communication module (40) comprising
 a receiver (46) configured to receive a first set of consecutive data bits

from another device, said first set of bits being sent by means a first set of pulses, **characterized in** that said communication module further comprises

5 a transmitter (42) configured to send a second set of bits to said another device at least partially simultaneously or at least partially interlaced with receiving said first set of bits from said another device.

34. A communication module (40) comprising

10 a transmitter (42) configured to send a first set of consecutive data bits to another device by means of a first set of pulses, **characterized in** that said communication module further comprises

a receiver (46) configured to receive a second set of bits from said another device at least partially simultaneously or at least partially interlaced with sending said first set of bits to said another device.